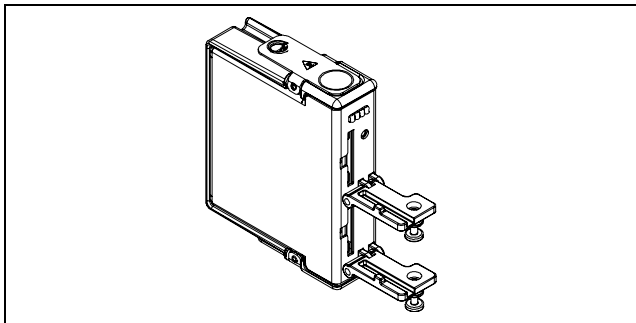


OPERATING INSTRUCTIONS AND SPECIFICATIONS

NI 9802

2 SD Card Memory Module



The National Instruments 9802 is an SD Card storage module that can read from and write to SD Cards.



Note The NI 9802 is supported only in CompactRIO active chassis, such as the cRIO-910x.

This document describes how to use the NI 9802 and includes specifications for the NI 9802. For information about installing, configuring, and programming the system, refer to the system documentation. Visit ni.com/info and enter the info code `rdsoftwareversion` to determine which software you need for the modules you are using.



Note The safety guidelines and specifications in this document are specific to the NI 9802. The other components in the system might not meet the same safety ratings and specifications. Refer to the documentation for each component in the system to determine the safety ratings and specifications for the entire system.

Safety Guidelines

Operate the NI 9802 only as described in these operating instructions.



Hot Surface This icon denotes that the component may be hot. Touching this component may result in bodily injury.

Safety Guidelines for Hazardous Locations

The NI 9802 is suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations; Class 1, Zone 2, AEx nA IIC T4, and Ex nA IIC T4 hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI 9802 in a potentially explosive environment. Not following these guidelines may result in serious injury or death.



Caution Do *not* insert or remove SD Cards unless power has been switched off or the area is known to be nonhazardous.



Caution Do *not* remove modules unless power has been switched off or the area is known to be nonhazardous.



Caution Substitution of components may impair suitability for Class I, Division 2.



Caution For Zone 2 applications, install the system in an enclosure rated to at least IP 54 as defined by IEC 60529 and EN 60529.

Special Conditions for Hazardous Locations Use in Europe

This equipment has been evaluated as Ex nA IIC T4 equipment under DEMKO Certificate No. 07 ATEX 0626664X. Each module is marked Ex II 3G and is suitable for use in Zone 2 hazardous locations. If you are using the NI 9802 in Gas Group IIC hazardous locations or in ambient temperatures of $-40\text{ }^{\circ}\text{C} \leq T_a \leq 70\text{ }^{\circ}\text{C}$, you must use the device in an NI chassis that has been evaluated as Ex nA IIC T4 equipment.

Special Conditions for Marine Applications

Some modules are Lloyd's Register (LR) Type Approved for marine applications. To verify Lloyd's Register certification, visit ni.com/certification and search for the LR certificate, or look for the Lloyd's Register mark on the module.



Caution To meet radio frequency emission requirements for marine applications, use shielded cables and install

the system in a metal enclosure. Suppression ferrites must be installed on power supply inputs near power entries to modules and controllers. Power supply and module cables must be separated on opposite sides of the enclosure and enter/exit through opposing enclosure walls.

Inserting and Removing SD Cards

The NI 9802 has two SD Card slots into which you can insert NI-approved SD Cards.



Note Using SD Cards that are not approved by NI might invalidate specifications and result in unreliable performance.

The card slots each have a door to protect the SD Cards while in the module. Each door is connected to a switch that indicates to the NI 9802 software when it is safe to read from or write to the SD Card.

The NI 9802 has four LEDs that indicate which slots contain an SD Card and if the SD Card is active. Refer to Figure 1 for the designation of SD Card slots and LEDs. Refer to Table 1 for

descriptions of each of the LEDs on the NI 9802 and when it is safe to remove SD Cards from the NI 9802.

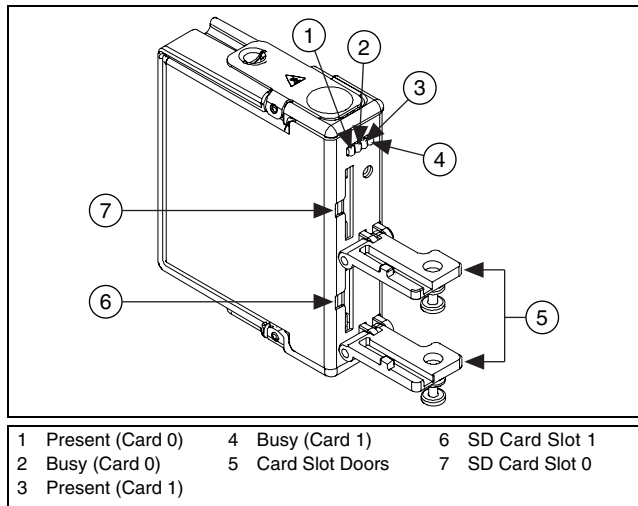


Figure 1. NI 9802 Card Slots and LEDs

LEDs

Table 1. LED Descriptions

LED	SD Card Slot	Description
Present (Card 0), Green	SD Card Slot 0	This LED is lit when an SD Card is in Slot 0 and the SD Card slot door is closed.
Busy (Card 0), Yellow	SD Card Slot 0	This LED is lit when the card in Slot 0 is active. This LED is flashing when the NI 9802 is performing I/O on the card in Slot 0. Do <i>not</i> remove the SD Card while this LED is lit or flashing.
Present (Card 1), Green	SD Card Slot 1	This LED is lit when an SD Card is in Slot 1 and the SD Card slot door is closed.
Busy (Card 1), Yellow	SD Card Slot 1	This LED is lit when the card in Slot 1 is active. This LED is flashing when the NI 9802 is performing I/O on the card in Slot 1. Do <i>not</i> remove the SD Card while this LED is lit or flashing.

SD Card Slot Doors

Do not open an SD Card slot door or remove an SD Card while the yellow LED for that card is lit or flashing. If you open an SD Card slot door while the yellow LED for that card is lit or flashing, the NI 9802 software acts to protect the file system of the SD Card. Refer to the software documentation for more information.



Caution Opening an SD Card slot door or removing an SD Card while the yellow LED for that card is lit or flashing might result in incomplete data.

You must close the slot door for the NI 9802 software to read from or write to the SD Card.



Note Screw the slot doors closed completely using a #1 Phillips screwdriver. Do not overtighten.

Sleep Mode

This module supports a low-power sleep mode. Support for sleep mode at the system level depends on the chassis that the module is plugged into. Refer to the chassis documentation for information

about support for sleep mode. You can enable sleep mode in software. Refer to the driver software documentation for more information.



Caution Do *not* enable sleep mode while either of the SD Card slot yellow LEDs are lit or flashing. Enabling sleep mode while either of the SD Card slot yellow LEDs is lit or flashing might result in incomplete data.

Typically, when a system is in sleep mode, you cannot communicate with the modules. In sleep mode, the system consumes minimal power and may dissipate less heat than it does in normal mode. Refer to the *Specifications* section for more information about power consumption.

Specifications

The following specifications are typical for the range -40 to 70 °C unless otherwise noted. Certification standards for some specifications vary based on the system in which you use the module.

Data Storage Characteristics

Number of SD Cards	2
Storage	2 GB max storage for each SD Card
Data transfer.....	2 MB/s read/write for one SD Card at a time
MTBF	2,106,312 hours at 25 °C; Bellcore Issue 6, Method 1, Case 3, Limited Part Stress Method



Note Contact NI for Bellcore MTBF specifications at other temperatures or for MIL-HDBK-217F specifications.

Power Requirements

Power consumption from chassis	
Active mode	400 mW max
Sleep mode	1 mA max

Physical Characteristics

If you need to clean the module, wipe it with a dry towel.

Weight..... 147 g (5.2 oz) without
SD Cards

Safety

Safety Standards

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1



Note For UL and other safety certifications, refer to the product label or visit ni.com/certification, search for the model number or product line, and click the appropriate link in the Certification column.

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4
Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, Ex nA IIC T4
Europe (DEMKO).....	Ex nA IIC T4

Environmental

National Instruments C Series modules are intended for indoor use only but may be used outdoors if installed in a suitable enclosure. Refer to the installation instructions for the chassis you are using for more information about meeting these specifications.

Operating temperature

(IEC 60068-2-1, IEC 60068-2-2) -40 to 70 °C

Storage temperature

(IEC 60068-2-1, IEC 60068-2-2) -40 to 85 °C

Ingress protection.....	IP 40 ¹
Operating humidity (IEC 60068-2-56).....	10 to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56).....	5 to 95% RH, noncondensing
Maximum altitude.....	2,000 m
Pollution Degree (IEC 60664)	2

Shock and Vibration

To meet these specifications, you must panel mount the system.

Operating vibration

Random (IEC 60068-2-34).....	5 g _{rms} , 10 to 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 to 500 Hz

Operating shock

(IEC 60068-2-27).....	30 g, 11 ms half sine, 50 g, 3 ms half sine, 18 shocks at 6 orientations
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¹ When two SD Cards are inserted and both SD Card slot doors are closed.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Industrial Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

CE Compliance

This product meets the essential requirements of applicable European directives, as amended for CE marking, as follows:

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; Electromagnetic Compatibility Directive (EMC)



Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search for the model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.htm.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at ni.com/support and follow the calling instructions or dial 512 795 8248. For

telephone support outside the United States, contact your local branch office:

Australia 1800 300 800, Austria 43 662 457990-0,
Belgium 32 (0) 2 757 0020, Brazil 55 11 3262 3599,
Canada 800 433 3488, China 86 21 5050 9800,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00,
Finland 385 (0) 9 725 72511, France 33 (0) 1 48 14 24 24,
Germany 49 89 7413130, India 91 80 41190000,
Israel 972 3 6393737, Italy 39 02 413091, Japan 81 3 5472 2970,
Korea 82 02 3451 3400, Lebanon 961 (0) 1 33 28 28,
Malaysia 1800 887710, Mexico 01 800 010 0793,
Netherlands 31 (0) 348 433 466, New Zealand 0800 553 322,
Norway 47 (0) 66 90 76 60, Poland 48 22 3390150,
Portugal 351 210 311 210, Russia 7 495 783 6851,
Singapore 1800 226 5886, Slovenia 386 3 425 42 00,
South Africa 27 0 11 805 8197, Spain 34 91 640 0085,
Sweden 46 (0) 8 587 895 00, Switzerland 41 56 2005151,
Taiwan 886 02 2377 2222, Thailand 662 278 6777,
Turkey 90 212 279 3031, United Kingdom 44 (0) 1635 523545

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